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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,489	12/31/2003	Ki-Min Lee	20059/PIA31071	1804

34431 7590 05/22/2006

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EXAMINER	
LEE, CALVIN	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/750,489	LEE, KI-MIN	
	Examiner	Art Unit	
	Lee, Calvin	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment dated March 28, 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-7,9-13 and 16-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-7,9-13 and 16-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

Response to Amendment

1. The amendment of claims 1, 3, 5-7, & 9-13, the cancellation of claims 4 & 14-15, and the addition of claims 16-24 dated March 28, 2006 are acknowledged.

Claim Rejections - 35 U.S.C. § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having skills in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,3,5-7,9-13 and 16-24 are rejected under 35 US.C 103(**a**) as being unpatentable over *Rasmussen* (US 2004/0262658) in view of *Lopatin et al* (US 6,433,379)

a) *Rasmussen* discloses a method of fabricating an MIM capacitor of high capacitance in a semiconductor device, the method comprising the steps of:

-depositing an interlayer dielectric film **25** of PSG or TEOS on a metal line **50**, **52** [¶ 0039]

-planarizing the interlayer dielectric film (see the flat top surface of the dielectric film in Fig. 9)

-etching the dielectric film to form a capacitor-forming region **41** [Fig. 10]

-sequentially depositing a lower electrode **71** [¶ 0042], an insulator layer **72** [¶ 0043], and an upper electrode **73** [¶ 0044] on the interlayer dielectric film;

-etching the lower electrode, the insulator layer, and the upper electrode to form the MIM capacitor [Fig. 11], wherein a capacitance of the MIM capacitor is determined by controlling a thickness of the interlayer dielectric film [¶ 0043].

b) In re claim 3, *Rasmussen* also suggests that the interlayer dielectric film is made of BPSG, PSG or TEOS [¶0039].

c) In re claims 5, 12, 18 and 22, *Rasmussen* suggests the insulator layer made of Ta_2O_5, Al_2O_3, Si_3N_4.

d) In re claims 6, 13, 19-20 and 23-24, *Rasmussen* suggests that the upper electrode is made of osmium, Pt, rhodium, Ru, palladium, or iridium [¶0044].

e) In re claims 1, 11 and 21, *Rasmussen* suggests the lower electrode comprising Os, Pt, Rh, Ru, Pd or Ir, but not Ti, W or TiN. *Lopatin et al* teaches a same method of fabricating an MIM capacitor of high capacitance, with a lower electrode **40** made of Ta, Ti, W, etc. [col. 4, ln.60].

It would have been obvious to one having skills in the art to combine the teachings of *Rasmussen* and *Lopatin et al,* and thus arrive at the claimed invention, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin,* 125 SUPQ 416. Moreover, it appears as if any electrode material including the claimed materials would work equivalently to any other well-known electrode material as long as the preferable electrode material has a desired conductive characteristic.

f) In re claims 7, 9-10 and 16-17, *Rasmussen* is silent about the lower electrode, the insulator layer and the upper electrode being planarized by CMP (or by an etch-back process). *Lopatin et al* suggests that the capacitor structure **10'** is planarized by CMP or etch back [Fig. 9 and col. 7].

It would have been obvious to one having skills in the art to have modified the process of *Rasmussen* by utilizing a CMP to planarize the capacitor structure for the purpose of forming a capacitor within its capacitor trench.

Response to Argument

4. Applicant's argued that the cited references disclose neither depositing a lower electrode layer comprising TiN nor planarizing the lower electrode layer, the insulator layer, and the upper electrode layer by an etch-back process. The Examiner notes that the combination of *Rasmussen'* 658 and *Lopatin et al* '379 vividly read on the above process steps found in claims 1 and 7, respectively. Therefore, above is a new ground of rejections, which the Examiner relies on to reject the pending claims.

Contact Information

5. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 on Mondays thru Thursdays 6:30-4:30PM. If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2818's Supervisory Patent Examiner *David Nelms* can be reached at (571) 272-1787. The fax phone number for the organization (where this application is assigned to) is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system at http://pair-direct.uspto.gov Should you have questions on access to the PAIR system, contact the Electronic Business Center at (866) 217-9197.

CL

ANDY HUYNH
PRIMARY EXAMINER

Dated: May 17, 2006